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TAXONOMIC STATUS OF SOME SPECIES FORMERLY REFERRED TO *MALMGRENIA* MACINTOSH 1874, WITH THE DESCRIPTION OF A NEW GENUS *LOBOPELMA* (POLYCHAETA:POLYNOIDAE)

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ABSTRACT

The genus *Malmgrenia* McIntosh, 1874, was recently synonymised with *Harmothoe* Kinberg, 1855 by Tebble and Chambers (1982). Eighteen species have been referred to *Malmgrenia* by previous authors. Examinations of type material (where possible), descriptions and additional material in this study indicate the species formerly referred to *Malmgrenia* are an artificial, polyphyletic group. Six of the species are referred to *Harmothoe*, two to *Halosydna* Kinberg 1855, one to *Hololepidella* Willey 1905, and a new genus *Lobopelma* is erected for *M. microscala* Kudenov, 1977. The status of the remaining species is discussed.

KEYWORDS: Polynoidae, *Malmgrenia,* taxonomic revision, *Lobopelma* new genus

INTRODUCTION

My interest in the genus *Malmgrenia* McIntosh, 1874 arose from a wider objective which was to examine the taxonomic, and eventually, phylogenetic status of the seven genera of polynoids characterised by a subterminal insertion of the lateral antennae upon the prostomium. The seven genera are *Malmgrenia, Paralepidonotus* Horst, 1915, *Alentia* Malmgren, 1865, *Gastrolepidia* Schmarda, 1861, *Arctonoe* Chamberlin, 1920, *Arctonoella* Buzhinskaya, 1967, and *Eulagisca* McIntosh, 1885.

Malmgrenia is the largest of the seven genera containing 14 species in Kudenov's (1977) treatment. These 14 species, with 4 additions are listed in Table 1. Before discussing the results of my examinations of material previously assigned to *Malmgrenia,* a brief outline of the historical background is presented.

The first publication of the name *Malmgrenia* was the description of *M. whiteavesii* by W.C. McIntosh in April 1874. Contrary to his usual thoroughness, the only clue given indicating that the name represented a new genus was a footnote underlying the description of *M. whiteavesii* (p. 263). The footnote briefly stated "The genus is a new one lately formed for certain British species". Just a few weeks later on May 19th 1874, McIntosh presented a paper to members of the Zoological Society of London in which he described in greater detail two more species, *M. castanea* and *M. andreapolis*. The paper describing these two species was not published until 1876, and it appears the publication of the 1874 paper describing *M. whiteavesii* before the descriptions of *M. castanea* and *M. andreapolis* were made public at the Society meeting, was accidental. In his monograph on British marine annelids McIntosh (1900) gave a generic diagnosis of *Malmgrenia* and incorrectly indicated 1876 as the first date of publication of the generic name.

The first author to question the status of *Malmgrenia* was Darboux (1899). He did not consider species of *Malmgrenia* should be separated from species of *Harmothoe* simply because they lacked cephalic peaks. Consequently, he referred all species of *Malmgrenia* to *Harmothoe*.

Willey (1902) disputed the synonymy, claiming the insertion of lateral antennae on the prostomium of species formerly placed in *Malmgrenia* was not similar to that of species of *Harmothoe* and warranted the retention of the genus *Malmgrenia* as defined by McIntosh 1900.

The validity of *Malmgrenia* was accepted by some authors, such as Fauvel 1923; Pettibone, (1953), and Day (1967) who refined the generic diagnosis to include important

features such as the number of body segments, and which of those segments bear elytra. Hartmann-Schroeder (1971) suggested that *Malmgrenia* should be considered as a subgenus of *Harmothoe* and Lagardere (1970) also proposed a close relationship between these two genera. However, in spite of these doubts over the status of the genus, more species of *Malmgrenia* have since been newly described or referred from other genera by various authors (see Table 1). Kudenov (1975, 1977) described two new species of *Malmgrenia* and provided a key to the majority of the species. He did not discuss the status of the genus and does not indicate to which subfamily it might belong. The last species description was that of *M. furcosetosa* Loshamn, 1981.

Tebble and Chambers (1982) included a number of species from the North Atlantic formerly ascribed to *Malmgrenia* under *Harmothoe*, as they considered the absence of cephalic peaks, and subterminal insertion of the lateral antennae not sufficient grounds to warrant separation of *Malmgrenia* species from *Harmothoe*. They included *M. castanea, M. andreapolis, M. lunulata* and *M. furcosetosa*. The type species of *Malmgrenia, M. whiteavesii* (designated by Hartman, 1959 by monotypy) is also from the North Alantic. However the unique, fragmented type is lost. The original description of the species is poor and reference to Article 69 of the International Code of Zoological Nomenclature (1985) suggests the genus *Malmgrenia* is currently invalid as it lacks a valid type species.

Leaving aside the problem of the status of the genus under the terms of the "Code", it is obvious some of the species currently referred to this genus have presented difficulties to taxonomists and led to conjecture over their taxonomic position in the Polynoidae. The major problem appears to be interpretation of the arrangement of the lateral antennae upon the prostomium and the level of taxonomic importance attached to differences in this arrangement. Consequently, in my examination of the material of *Malmgrenia* species I have adopted a set of criteria which I hope others may also find useful in overcoming these problems of interpretation.

Methods. Where possible I have examined the type material and any other additional material available. Original descriptions of all species of *Malmgrenia* were also examined.

Subfamily classification. The distinction between the two main subfamilies of the Polynoidae is primarily dependent on the way in which the pair of lateral antennae are inserted upon the prostomium. In the Lepidonotinae the lateral antennae are considered to be inserted terminally, on the ends of the prostomium on either side of the median antennae. The ceratophores of the lateral antennae are anterior prolongations of each half of the prostomium and the ceratophores of all three antennae tend lie in the same plane. Examples of this type are illustrated in Fig. 1 B, D, F.

The other large subfamily, the Harmothoinae, is characterised by taxa on which the lateral antennae are inserted ventrally, lying under the anterior peaks of the prostomium, and consequently, lying at a lower level than the median antenna. Examples of this type of arrangement are also illustrated in Fig. 1 A, C, E.

There are 16 other subfamilies of Polynoidae, characterised in general by a reduction in the number of antennae on the prostomium and/or the possession of unusual features such as branchiae (Fauchald, 1977; Muir, 1982; Pettibone, 1985). The majority of polynoid species are however, still assigned to one or other of the two major subfamilies, and for the most part, determination of affiliation with either of these two subfamilies is straightforward. A small group of genera and species are exceptional (primarily the members of the seven genera referred to in the Introduction) as they possess lateral antennae which are inserted subterminally. Although the lateral antennae do appear to be attached to the anterior ends of the prostomium, they lie at a lower level than the median antenna (Fig. 1 G).

As a consequence of the difficulty associated with interpreting this subterminal type of lateral antennae attachment, the taxonomic status of many of these species has been uncertain, particularly when assignment to subfamily is considered. For example, Loshamn (1981) places *Malmgrenia* species within the Harmothoinae while Fauchald (1977) places them under Lepidonotinae.

Without reference to other characters, it is difficult to avoid making an arbitrary decision. There appear to be few characters which could be useful, but after examining some examples of *Lepidonotus* and *Harmothoe* species I have adopted the following approach which, while not entirely satisfactory, will I believe, prove to have some taxonomic utility.

In Fig. 2, I have illustrated ventral views of the prostomia of the specimens depicted in Fig. 1. Manipulation of specimens into a position enabling a good ventral view of the prostomium is sometimes difficult, particularly with small specimens, and may require the removal of one or both palps.

The specimens selected for illustration here as representatives of each genus were chosen because each shows a high level of agreement with recent descriptions of those genera. The three *Lepidonotus* species are all specimens collected in N.T. waters. The *Harmothoe* sp. is an as yet undescribed species from N.T. waters. *Harmothoe imbricata* is a specimen collected from Hong Kong and *H. praeclara* is a specimen donated by the South Australian Museum.

The three species of *Lepidonotus* (Fig. 2 B, D, F) all show a high level of similarity in the appearance of the underside of the prostomium. The lateral antennae are on anterior continuations of the prostomium without distinct ceratophores. Similar patterns are also found on representatives of the two other genera traditionally placed in the Lepidonotinae, *Parahalosydna* and *Halosydnopsis* (Fig. 3 A, B).

The three species of *Harmothoe* figured do not show quite the same level of similarity. All three differ from Lepidonotinae in that the lateral antennae have ceratophores inserterd ventrally and fused for at least part of their length, to the underside of the prostomium (Fig. 2 A, C, E). However, they differ from each other in the extent to which the posterior edges of the lateral ceratophores merge with each other in the midline. On *Harmothoe sp.* (Fig. 2 E) the bases of the ceratophores, while attached ventrally, are quite well separated. On *H. imbricata,* (Fig. 2 A) the bases almost meet, and on *H. praeclara* (Fig. 2 C) the bases of the ceratophores are fused for a part of their length. Members of the genus *Harmothoe* appear to form a transitional series from species with widely separated ceratophores to those exhibiting fusion of the ceratophores for some part of their length.

It may be that the present group of species currently referred to *Harmothoe* is polyphyletic (*sensu* Wiley, 1981: 86-87), containing several discrete groups of species. However, elucidation of this possibility is dependent on a revision of the species of *Harmothoe* (well over 100), which is beyond the scope of this work.

Therefore, in this revision of species formerly assigned to *Malmgrenia,* I shall place all species that exhibit the characteristic pattern shown in Figure 2 for the lepidonotine polynoids in the Lepidonotinae, and those which exhibit a pattern similar to the range of variation exhibited by the *Harmothoe* species shown in Figure 2 will be aligned with the Harmothoinae.

Characters. The terminology adopted here for description of taxonomic characters largely follows currently accepted criteria. Definitions of characters used here are those of Muir (1982) except for the manner of recording the pattern of elytron attachment and the use of the word setae (= chaetae in Muir 1982). Elytron attachment to segments is recorded after the method of Pettibone (see 1953:9, 1985, 1986 a,b for examples). The first body segment is considered to be the one bearing tentacular cirri, and the first pair of elytra are therefore attached to segment 2. The standard pattern of attachment in Polynoidae is then 2,4,5,7,9, . . . etc.

The numbers of pairs of elytra, *and* their pattern of attachment on a specimen is of paramount importance in determining generic status. Even in those genera for which the numbers of pairs of elytra on mature specimens is found to be variable, the pattern of elytron attachment is often discrete enough to be useful in distinguishing between genera (e.g. Pettibone, 1969,1977).

Descriptions. Comprehensive descriptions of species referred to other genera are not given here. The rationale behind referral to another genus is given under remarks. I suspect that in at least several cases, species I have referred to other genera will prove to be synonymous with existing species already described for those genera. In these cases, full description of species should be accompanied by a revision of the genus to which species have been assigned. The exception

here, is the new genus *Lobopelma* for which a diagnosis and a description of the type species is given.

Material. Some of the species referred to *Malmgrenia* presented a problem as the type material was not available for examination. For some of these species, the original and subsequent descriptions are detailed enough to allow a decision on which genera each of the species should be placed in. The remainder are species with indequate descriptions, and I have accordingly placed the species as Incertae sedis, with some discussion of the possible taxonomic position.

The following abbreviations occur in the text to indicate the present location of the material examined or discussed: AHF Allan Hancock Foundation, University of South-

Table 1. A list of *Malmgrenia* species compiled from Pettibone 1953, Kudenov 1977, Loshamn 1981 and McIntosh 1900.

Name	Original name, author and date	Referred to *Malmgrenia* by	Type locality	Location of Type specimen
Malmgrenia whiteavesii	*Malmgrenia Whiteavesii* McIntosh, 1874	-	Gulf of St Lawrence	BMNH now lost
M. castanea	*M. castanea* McIntosh, 1876	-	North Unst, Shetland	BMNH
M. andreapolis	*M. andreapolis* McIntosh, 1876	-	St Andrews, Scotland	BMNH
M. crassicirrus	*M. crassicirrus* Willey, 1902	-	Cape Adare, Antarctica	BMNH
M. micropoides	*M. micropoides* Augener, 1918	-	Annobon, West Africa	ZMH
M. nigralba	*M. nigralba* E. Berkeley, 1923	-	Western Canada	USNM
M. curacaoensis	*Paralepidonotus boholensis curacaoensis* Horst, 1922	Augener 1927	Curacao, West Indies	ZMA
M. nesiotes	*Polynoe nesiotes* Chamberlin, 1919	Hartman 1938	Lower California	USNM
M. alba	*Laenilla alba* Malmgren, 1865	Hartman 1959	Finmark	NRS
M. ampulliferoides	*M. ampulliferoides* Uschakov & Wu, 1959	-	Yellow Sea, China	IOAS
M. purpura	*M. purpura* Day, 1960	-	False Bay, South Africa	USNM
M. marquesensis	*Allmaniella marquesensis* Monro, 1928	Day 1962	Marquesas Is. South Pacific	BMNH
M. monoechinata	*M. monoechinata* Rullier, 1965	-	Moreton Bay, Queensland	AM
M. phillipensis	*M. phillipensis* Knox & Cameron, 1971	-	Port Phillip Bay, Victoria	MV
M. hartmanae	*M. hartmanae* Kudenov, 1975	-	Gulf of California, Mexico	AHF
M. microscala	*M. microscala* Kudenov, 1977	-	Port Phillip Bay, Victoria	MV
M. furcosetosa	*M. furcosetosa* Loshamn, 1981	-	Bohuslan, Sweden	NRS
M. lunulata	*Polynoe lunulata* Delle Chiaje, 1841	Pettibone 1953	Mediterranean	?

Table 2. Taxonomic status of species formerly referred to *Malmgrenia*

Name of species	*Referred to*	*Referred by - indicates this paper*
Malmgrenia whiteavesii McIntosh, 1874	indeterminable	-
M. castanea McIntosh, 1876	*Harmothoe castanea*	Tebble and Chambers 1982
M. andreapolis McIntosh, 1876	*Harmothoe andreopolis*	Tebble and Chambers 1982
M. crassicirrus Willey, 1902	*Harmothoe crassicirrus*	-
M. micropoides Augener, 1918	*?Harmothoe* sp.	-
M. nigralba Berkeley, 1923	*Harmothoe nigralba*	-
M. curacaoensis (Horst, 1922)	*Harmothoe* sp.	M. Pettibone (pers. comm.)
M. nesiotes (Chamberlin, 1919)	*Halosydna nesiotes*	-
M. alba (Malmgren, 1865)	indeterminable	-
M. ampulliferoides Uschakov and Wu, 1959	*?Paralepidonotus ampulliferus*	-
M. purpura Day, 1962	*? Paralepidonotus* sp.	-
M. marquesensis (Monro, 1928)	*Hololepidella nigropunctata*	-
M. monoechinata Rullier, 1965	*? monoechinata*	-
M. phillipensis Knox and Cameron, 1971	*Harmothoe phillipensis*	-
M. hartmanae Kudenov, 1975	*Halosydna hartmanae*	-
M. microscala Kudenov, 1977	*Lobopelma microscala*	-
M. furcosetosa Loshamn, 1981	*Harmothoe furcosetosa*	Tebble and Chambers 1982

ern California, Los Angeles; AM Australian Museum, Sydney; BMNH British Museum of Natural History, London; IOAS Institute of Oceanology, Academy of Scienee, China; NRS Naturhistoriska Riksmuseet, Stockholm; NTM Northern Territory Museum, Darwin; MV Museum of Victoria, Melbourne; RSM Royal Scottish Museum, Edinburgh; USNM National Museum of Natural History, Smithsonian Institution, Washington; ZMA Zoologische Museum, Amsterdam.

SYSTEMATICS

Sub family Harmothoinae Horst, 1917

Genus *Harmothoe* Kinberg, 1855

Harmothoe andreapolis (McIntosh, 1876)

Malmgrenia andreapolis McIntosh 1874:195; 1876: 377-378, P1. LXVII, Figs 20-23.

Harmothoe andreapolis Tebble and Chambers, 1982: 49-50, Figs 16 a-d, 46, 47.

Type material. SYNTYPES - BMNH. ZK 1921.5.1. 510-511. St Andrews, Fife, Coll. W.C. McIntosh.

Additional material. R.S.M. Irish Sea, off Clogher Head, 53° 46′N, 6° 08′ W, very fine sand eoll. Det. Pres. M. Parker. Fisheries Researeh Centre, Dublin, Ireland.

Remarks. The type material available for examination was in poor condition and eomprises two anterior ends and a large posterior fragment presumably from a third specimen. The ventral side of the prostomium (which lacks cephalic peaks) was examined on both the syntypes and the RSM material (Fig. 3 D). The eeratophores of the lateral antennae on the material examined are fused ventrally in the midline, although the suture where the outer edge of eaeh ceratophore is fused to the underside of the prostomium is clearly visible (Fig. 3 D). This arrangement of lateral ceratophores on the ventral surface of the prostomium is similar to that found on specimens of *H. praeclara* (Fig. 2 C) although there is a greater degree of fusion of the ceratophores in the midline on speeimens of *H. andreapolis*.

The syntypes examined were ineomplete and therefore deduetion of the numbers of pairs of elytra and their pattern of arrangement was not possible. However, in the original description of this species McIntosh states there are 15 pairs of elytra, and after comparison of the setae, elytra and parapodia of the type material and RSM specimen, I concur with Tebble and Chambers (1982) that all the material is eonspecific. The RSM specimen is in excellent condition and the 15 pairs of elytra were attached on segments 2, 4, 5, 7, 9, ...21, 23, 26, 29, and 32. The notopodia have short acicular lobes and the neuropodia each have a supraacicular lobe. These features are found among species of *Harmothoe*, as are the similar thiekness of the notosetae and neurosetae, and the shape and extent of the spinous patches on the distal ends of the neurosetae.

Harmothoe castanea (McIntosh, 1876)

Malmgrenia castanea McIntosh, 1876:376-377, P1.LXVII, Figs 15-18.

Harmothoe castanea Tebble and Chambers, 1982:47-49, Figs 15, 44,45.

Type material. SYNTYPES - BMNH ZK 1921.5. 1. 507. 28 miles NNE of North Unst. Shetland, 85 fathoms on *Spatangus purpureus*, coll. W.C. McIntosh.

Additional material. RSM 59° 15.77′ coll. 8.v. 1983, MV "Whitethorn". 125m, fine, very shelly, sand, IGS code 59-02/284.

Remarks. I have examined the type material of this speeies. The specimens were not in good condition. Comparisons with the representative species of *Harmothoe* illustrated in Fig. 2 demonstrated the mode of insertion of the lateral antennae upon the underside of the prostomium in the types and the RSM material (Fig. 3 E) is very similar in appearance to that of *H. praeclara* (Fig. 2 C).

The material examined (where complete) has 15 pairs of elytra arranged on segments 2, 4, 5, 7, 9, . . . 21, 23, 26, 29, and 32. The body is short (36-38 segments) and the last pair of elytra effectively cover the posterior segments. The notopodia have relatively short aeieular lobes and the neuropodia have a small supraacicular lobe. Notosetae and neurosetae are similar in thickness. The neurosetae have relatively short distal spinous pateh̄es. The neurosetae are mainly unidentate but there are a few weakly bidentate. All of these charaeteristics are consistant with species of *Harmothoe*.

Harmothoe furcosetosa Loshamn, 1981

Malmgrenia furcosetosa Loshamn, 1981: 5-7, Fig. 1, A-L.

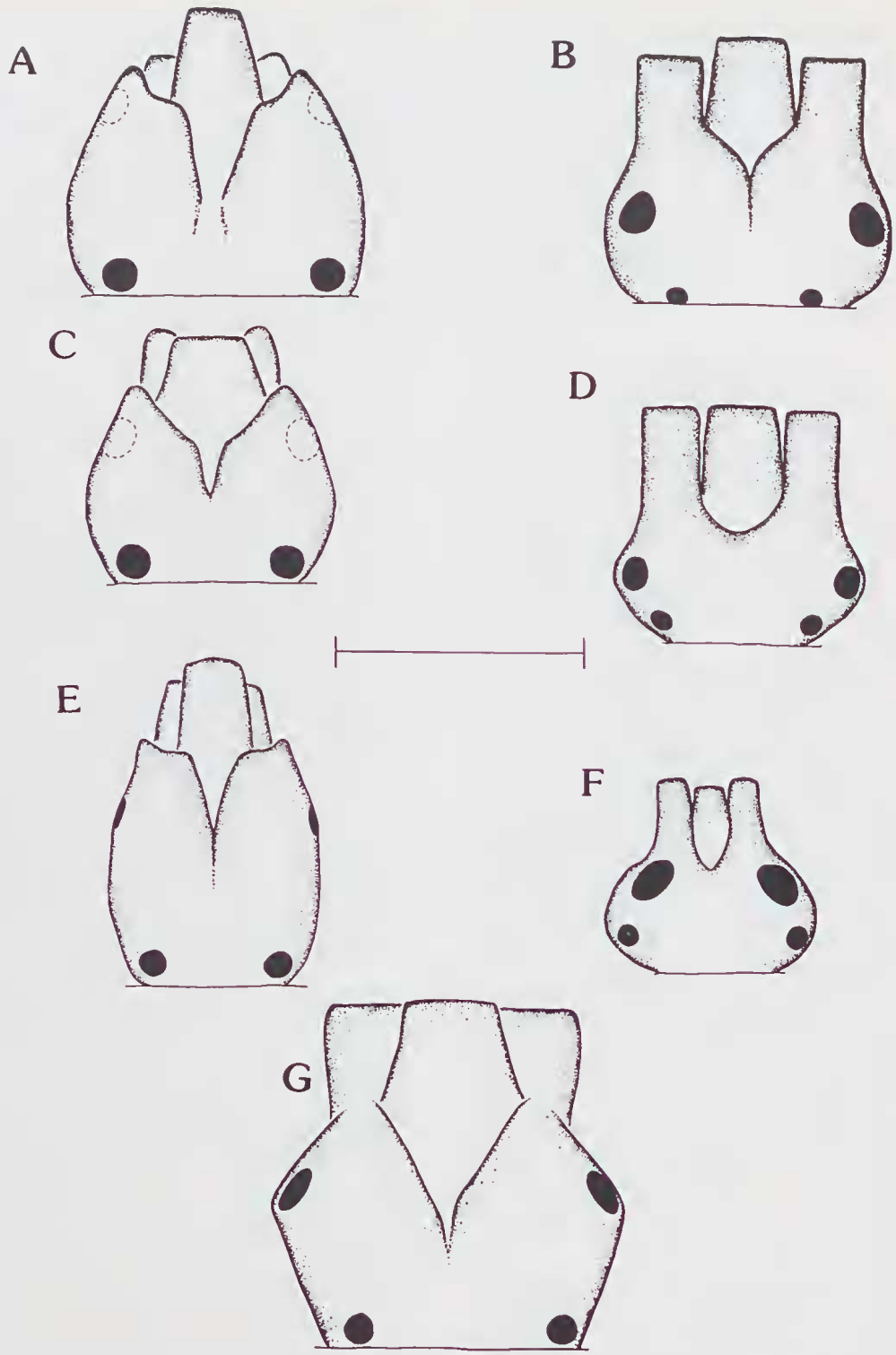

Fig. 1. Dorsal views of prostomia of representative polynoid species: **A**, *Harmothoe imbricata* NTM W3869; **B**, *Lepidonotus glaucus* NTM W190; **C**, *Harmothoe praeclara* NTM W 1566; **D**, *Lepidonotus cristatus* NTM W 253; **E**, *Harmothoe sp.* NTM W 201; **F**, *Lepidonotus kumari* NTM W2686; **G**, *Paralepidonotus ampulliferus* NTM W 2122. Scale line 0.5 mm.

Harmothoe furcosetosa Tebble and Chambers, 1982: 42-43, Figs 1e, 13a,b,e, 39.

Material. RSM. 1981. 109. Clyde Sea. coll. R.B. Clark 1949-50. det. S. Chambers, v 1980. RSM 1983.12.08. Helford. coll. R.B. Clark, 11 iv. 1964. RSM 1962.32.12. Clyde Sea, Etteriek Bay. R.B. Clark coll. 1949-50.

Remarks. I have not examined the type material of this speeies. However, this species is one that was reeently ineluded in *Harmothoe* by Tebble and Chambers (1982). The RSM speeimens sent to me for examination eoneur in every respeet with the original type deseription of Loshamn and the speeies is easily reeognised by the distinetive notosetae from which the species name is derived. Examination of the ventral side of the prostomium of the specimens indieates the type of attaehment of lateral ceratophores is similar to that found on speeimens of *H. praeclara* (Fig. 2 C), although the degree of fusion of the eeratophores in the midline is greater on speeimens of *H. furcosetosa* (Fig. 3 G).

Features of the parapodia of *H. furcosetosa* are consistant with *Harmothoe* speeies, partieularly the presence of a short, supraacieular extension of the presetal lobe of the neuropodium. Other charaeteristies whieh ally this speeies with *Harmothoe* are the numbers of pairs of elytra and their disposition on the body and the shape of the neurosetae.

***Harmothoe nigralba* (Berkeley) comb. nov.**

Malmgrenia nigralba Berkeley, 1923 :213-214, P1. 1, Figs 5-7.

Malmgrenia lunulata Pettibone, 1953:25

Type material SYNTYPES - USNM 32875, 32876 Pipers Lagoon, Vancouver Island, British Columbia. June 20th, 1920.

Additional material. AHF 7926. Departure Bay, British Columbia, July 3, 1940. coll. MaeGinitie.

Remarks. There are other syntypes (BMNH) which have not been examined. The original description indieates the length of one speeimen only, 18mm, with 40 segments, though apparently no holotype was designated. The USNM syntypes comprise three speeimens, two of which were complete with 39 segments (14mm long) and 34 segments (11mm long) respeetively. The third ineomplete speeimen has 25 segments and is 10mm long. The AHF speeimen is 16 mm long and has 40 segments. There are 15 pairs of elytra attached on segments 2,4,5,7,9,.....21,23,26,29 & 32. The standard arrangement in *Harmothoe* speeies and those of many other genera. The prostomium is broader at the base than it is anteriorly and there are no eephalie peaks. The eeratophores of the lateral antennae are elearly fused in the midline on the ventral side of the prostomium on speeimens of *H. nigralba* (Fig. 3 F,H). The degree of fusion is similar to that observed on *H. andreapolis*, *H. castenea* and *H. furcosetosa* (Fig. 3,D,E,G), and is slightly greater than that observed for speeimens of *H. praeclara* (Fig. 2 C). The general shape of the prostomium and the position of the two pairs of eyes of this speeies resembles elosely the prostomial features of a number of Harmothoe speeies ineluding *H. andreapolis*, *H. marphsyae* and *H. ljungmani*. In addition the neuropodia, whieh have a small supraacieular prolongation on the presetal lobe are typieal of *Harmothoe* speeies, as are the eharaeteristies of the notosetae and neurosetae. The neurosetae bear a elose resemblance to those seen on speeimens of *H. andreapolis*, a fact referred to in the original deseription. However, the knob-like tips of the neurosetae on speeimens of *H. nigralba* do not seem as well developed as those of *H. andreapolis*. The elytra of the two speeies are also similar but on speeimens of *H. nigralba* the ring of dark pigment is well defined and often eomplete, whereas on speeimens of *H. andreapolis* it is usually a poorly defined are of pigment. The surface of the elytra of *H. nigralba* also have a prominent polygonal pattern of interseeting white lines not seen on elytra from speeimens of *H. andreapolis*.

Pettibone (1953) referred this speeies to *M. lunulata* (Delle Chiaje) 1841 but has since (pers. eomm.) ehanged her mind and now eonsiders it to be a valid speeies although she does not agree that it is a species of *Harmothoe*.

***Harmothoe phillipensis* (Knox and Cameron) comb. nov.**

Malmgrenia phillipensis Knox and Cameron, 1971:22-23, Figs 1-6; Kudenov 1977: 85-89, P1. 1a-n.

Type material. HOLOTYPE - MV G1736, Prince George Buoy, Port Phillip Bay, Victoria. coll. Port Phillip survey 11.9.1960.

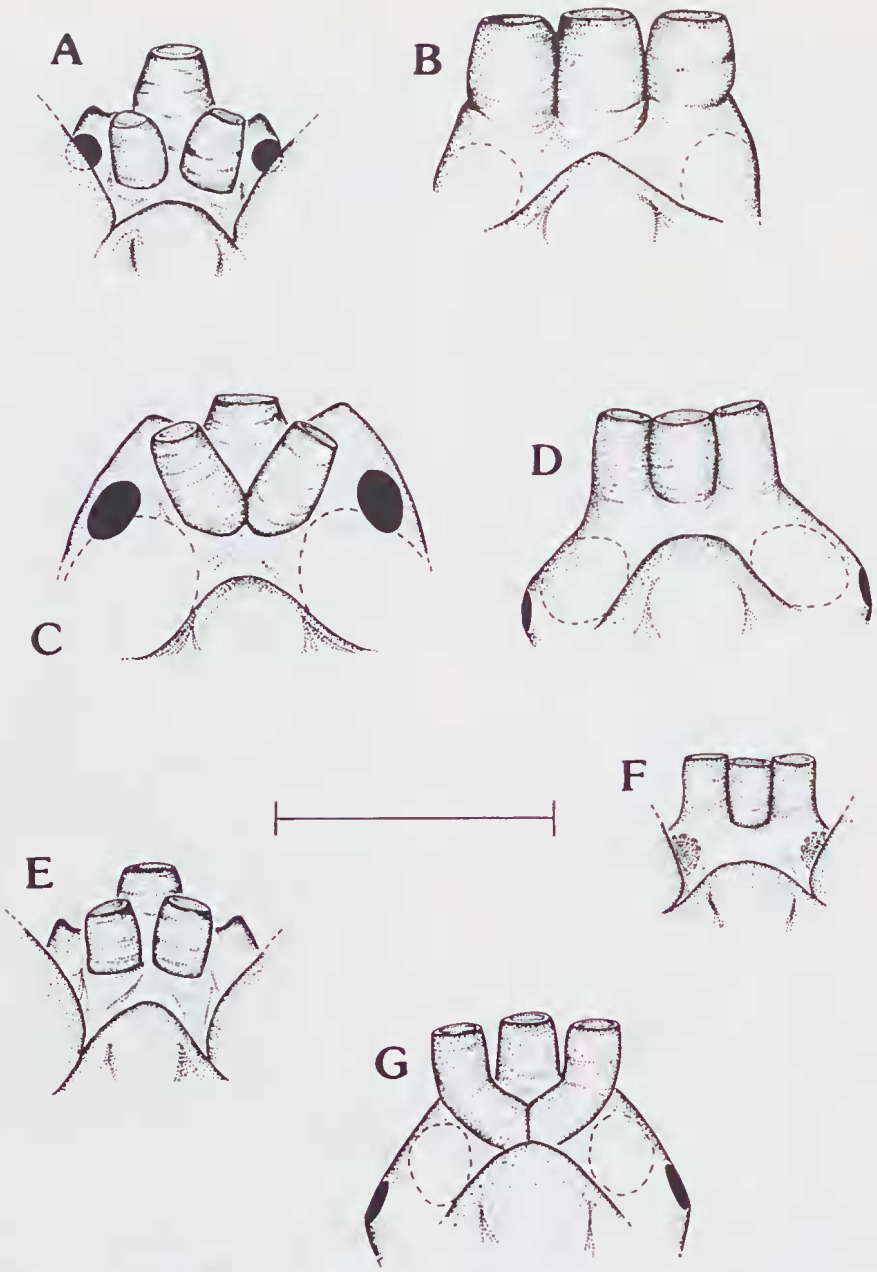

Fig. 2. Ventral views of anterior ends of prostomia of representative polynoid species (dashed lines indicate position of palps which have been removed): **A**, *Harmothoe imbricata* NTM W3869; **B**, *Lepidonotus glaucus* NTM W190; **C**, *Harmothoe praeclara* NTM W1566; **D**, *Lepidonotus cristatus* NTM W253; **E**, *Harmothoe sp.* NTM W201; **F**, *Lepidonotus kumari* NTM W2686; **G**, *Paralepidonotus ampulliferus* NTM W2122. Scale line 0.5 mm.

PARATYPES - MV G1737, Quiet corner, Port Phillip Bay, Victoria. coll Port Phillip survey.

Additional material. AM W7268 W7279, Station 958, Port Phillip Bay, coll. Port Phillip Survey; AHF 00103-01; Port Phillip Bay, Victoria.

Remarks. The bases of the lateral ceratophores meet in the midline on the underside of the prostomium of the holotype (Fig. 3 I). This arrangement closely resembles that seen on specimens of *H. praeclara* (Fig. 2 C). The material examined agrees well with the descriptions provided by Knox

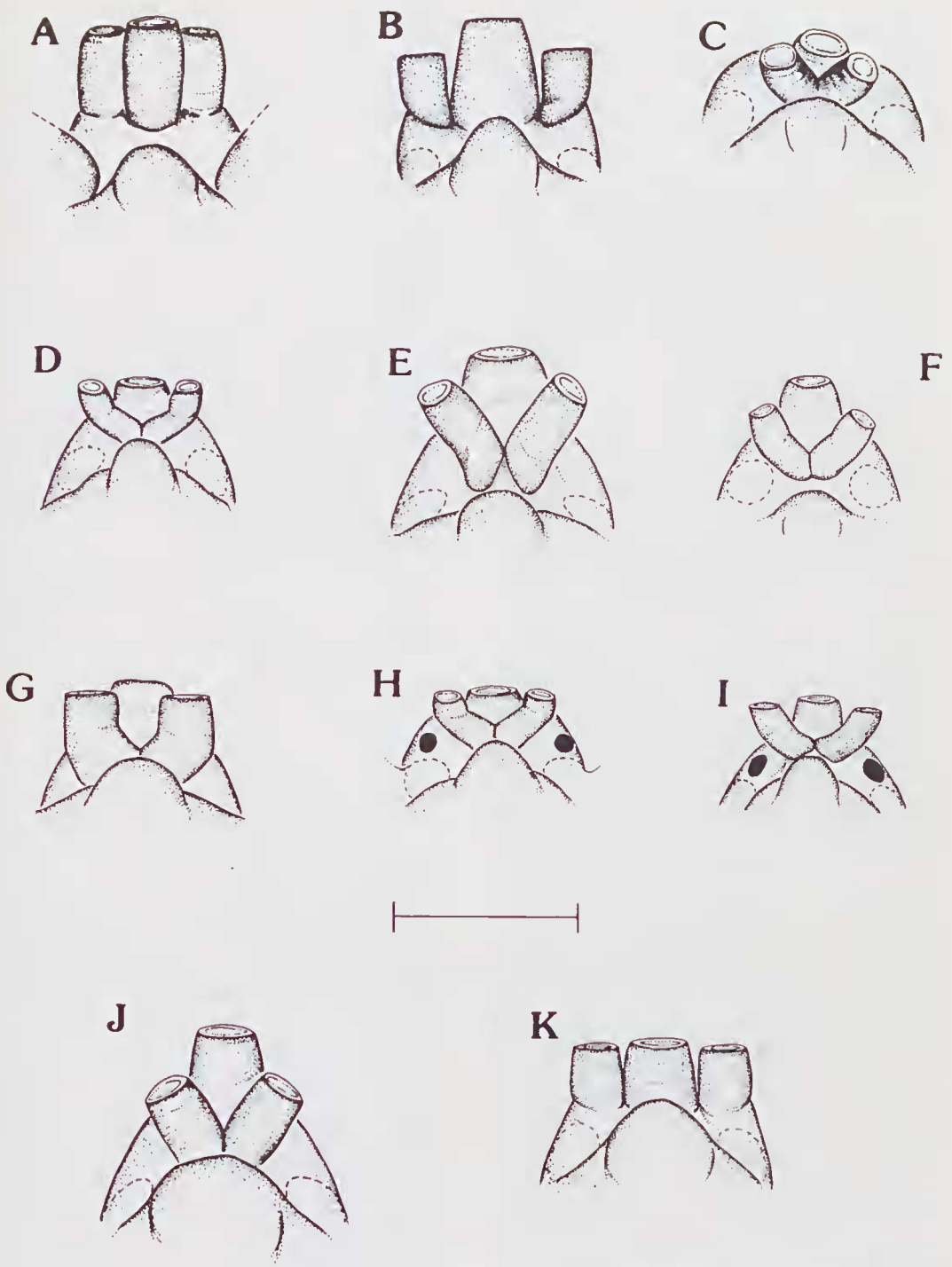

Fig. 3. Ventral views of anterior ends of prostomia of representative polynoid species and some species formerly referred to *Malmgrenia* (Dashed lines indicate position of palps): **A**, *Parahalosydna pleiolepis* NTM W3867; **B**, *Halosydnopsis pilosa* NTM W524; **C**, *Malmgrenia? monoechinata* AM W379; **D**, *Harmothoe andreapolis* RSM; **E**, *Harmothoe castanea* RSM IGS 59-02/284. **F**, *Harmothoe nigralba* USNM 32876; **G**, *Harmothoe furcosetosa* RSM 1983.12.08; **H**, *Harmothoe nigralba* AHF 7926; **I**, *Harmothoe phillipensis* AHF 000103-01; **J**, *Lobopelma microscala* MV G2544; **K**, *Halosydna hartmanae* AHF 1118. Scale line 0.5 mm.

& Cameron, and later Kudenov. I agree with Kudenov that the longitudinal ridges on the dorsal surface of some elytra are artifacts of preservation. Although both descriptions state there are 15 pairs of elytra present on specimens of *H. phillipensis*, there is no mention of their arrangement upon the body. The elytra are found on segments 2, 4, 5, 7, 9.....21, 23, 26, 29 and 32, the standard pattern for many genera, including *Harmothoe*. The parapodia are like those of many *Harmothoe* species, and coupled with the characteristics of the setae, which are also typical of *Harmothoe* species, provides the basis for including *H. phillipensis* in the genus *Harmothoe*.

Harmothoe sp.

Paralepidonotus boholensis curacaoensis Horst,1922:198.

Malmgrenia curacaoensis Augener, 1927:45-47, Fig. 2A-D.

Type material. HOLOTYPE - ZMA V. Pol. 1039. Curacao, "Spaansche water". inside *Porites porites*. coll. van der Horst, 1920.

Remarks. I had cause to examine this specimen when revising the genus *Paralepidonotus*. At that time I decided it was not a species of *Paralepidonotus*, primarily because it lacked ventral lamellae (contrary to the original description). Dr Marian Pettibone has advised me the species was, (pers. comm.) in her opinion, synonymous with one of the species of *Harmothoe* from the Caribbean described by Treadwell, and that both are to be referred to a new genus. However, after examination of the specimen I consider this species is sufficiently similar to *Harmothoe* species to warrant its inclusion in that genus. Perhaps the only criterion which would exclude it is the lack of cephalic peaks — and in this paper that is not considered sufficient grounds for separation from *Harmothoe*.

Genus *Hololepidella* Willey, 1905

Hololepidella nigropunctata Horst, 1915

Allmaniella marquesensis Monro, 1928:469-471, Figs 1-4.

Malmgrenia marquesensis Day, 1962:628, 629

Type material. SYNTYPES - BMNH ZK 1928 1.11. 1/3 Tai O Hae Pool, The Marquesas, coll C. Crossland, 1928.

Remarks. Of the five syntypes, only two specimens are complete, the larger (8.7mm) has 41 segments and 19 pairs of elytra, the smaller individual (6.3mm) has 37 segments and 17 pairs of elytra. All but a few of the elytra have become detached from the specimens.

The current diagnoses of the genera *Malmgrenia* and *Harmothoe* require members of these genera possess a maximum of 15 pairs of elytra (Fauchald 1977). As both complete specimens of *M. marquesensis* have more than 15 pairs of elytra, they were incorrectly referred to *Malmgrenia* by Day (1962) and cannot be referred to *Harmothoe*.

Monro originally placed the species in the genus *Allmaniella*, however, a comparison of the syntypes with the generic diagnosis given in Fauchald (1977) rejects their inclusion within *Allmaniella* as the specimens all lack the diagnostic feature of greatly enlarged and extended prostomial lobes.

On polynoid scaleworms with 15 or more pairs of elytra, the great majority of genera have the first 15 pairs of elytra attached to segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 26, 29 and 32. Thereafter, if more pairs of elytra are present their attachment pattern varies between genera and is of diagnostic importance.

A few genera are unusual in that they exhibit a deviation from this common pattern of attachment for the first 15 pairs of elytra. One of these genera, *Hololepidella* has the elytra attached on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 26, 29, 31, 34, and subsequent pairs (with some irregularity) on alternate segments to the end of the body (Pettibone 1969). The two complete specimens of *M. marquesensis* both exhibit this pattern of elytron attachment which is characteristic of *Hololepidella* species. Reference to the key to *Hololepidella* species compiled by Hartmann-Schroeder (1984), and descriptions of *H. nigropunctata* (Horst 1915, 1917; Pettibone 1969) demonstrated the syntypes of *M. marquesensis* possess the characteristic features of prostomium, setae, parapodia and elytra which have been ascribed to specimens of *H. nigropunctata*.

Lobopelma gen. nov.

Type Species *Malmgrenia microscala* Kudenov, 1977.

Diagnosis. Body short, flattened, fusiform; segments up to 38. Elytra and prominent elytrophores. Sixteen to eighteen pairs of elytra on segments 2,4,5,7,9,11,13,15,17,19,21,23,26,29,32,35, last one to three pairs variable on segments 36,37, or 38 and sometimes asymmetrical. Elytra smooth, without papillae or tubereles. Prostomium bilobed, hexagonal, longer than broad. Cephalic peaks absent. Two pairs of eyes. Two palps. Three antennae, lateral antennae inserted ventrally, median ceratophore curved upwards. Lateral antennae with ceratophores fused in the midline for at least part of their length on the underside of the prostomium (Fig. 3 J). Two pairs of tentacular cirri. Segment 2 with elongate buccal cirri. Parapodia biramous, notopodia shorter than neuropodia. Notosetae stouter then neurosetae. Dorsal cirri present, ventral cirri shorter. Each parapodium with a pair of conspicuous fleshy lobes, the inner one often tripalmate. Pygidium, small rectangular, with pair of anal cirri.

Etymology. The genus is named for the distinctive lobes found on the ventral surface of the parapodia. Gender feminine.

Lobopelma microscala (Kudenov) comb. nov.

(Figs 3 J, 4)

Malmgrenia microscala Kudenov, 1977:90-95, Pl. 2 a-m.

Type material. All type material was collected from Port Phillip Bay, Vietoria by the Port Phillip Bay Environmental Survey. HOLOTYPE - MV G2544, Station 953, Sand, 3m, 11. vi. 1971. PARATYPES - MV G2545, Station 930, Sandy, 10m, 11. ii. 1970; MV G2546, Station 940, silty clay, 8m, 12.ii.1970; AM W7280, Station 944, Sand, 2m, 10.VI.1971; AM W7281, Station 985, sand, 9m. 9.xii. 1971.

Description. *Holotype:* Body dorsally flattened, fusiform. Length 12 mm, width including parapodia 3.40 mm. 37 segments. Elytra overlapping medially and posteriorly. A pair of anal cirri (missing). Body colour light brown, tinged red by dye from label.

Prostomium bilobed, longer than broad, hexagonal, anterior half thinner than posterior half (Figs 3J,4A). Cephalic peaks absent. Two pairs of eyes. Anterior pair larger, circular, lying laterally, anterior to greatest width of prostomium. Posterior pair circular, dorsal, closer to midline. Two palps, gently tapering. Three antennae, sparsely papillated. Lateral antennae short, stout bases, filiform tips. Ceratophores well-defined, merge ventrally (Fig.3 J). Median antennae much longer, gently tapering to filiform tip, median ceratophore terminal, curved upwards.

Two pairs of tentaeular cirri, sparsely papillated, resemble median antennae, dorsal pair longer than ventral pair. A single seta projects from each tentaculophore.

Parapodia biramous. Notopodium rounded, acicular lobe elongate. Notoaciculum protuding. Neuropodium elongate, presetal lobe extended, lanceolate, much longer than triangular, postsetal lobe. Neuraciculum protuding. Dorsal cirri long, cirriform, sparsely papillated, extending well beyond neurosetae. Ventral cirri much shorter than neuropodium, cirriform, smooth. Unusual, large, tripalmate lobe and smaller, cylindrical lobe lie ventrally on each parapodium between ventral cirrus and well-developed nephridial papilla (Fig. 4 C, D).

Notosetae curved, sabre-like, with many rows of fine serrations and blunt, smooth tips. Inferior notosetae longer than superior ones (Fig. 4 E). Neurosetae longer, thinner, with rows of serrations restricted to distal part below unidentate tip. Superior neurosetae with greatest number of serrated rows, inferior neurosetae with least number of rows (Fig. 4 F-H). Seventeen pairs of elytra attached on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 26, 29, 32, 35, 36, Elytra tinged reddish pink (with leached dye from specimen label). Elytra on segment 2 circular, subsequent pairs markedly reniform, gradually becoming oval towards posterior end of body. Elytra smooth, without fringe of papillae (Fig. 4 B).

Paratypes: None of the material has been affected by dye. The elytra are colourless and opaque. The prostomium is a slightly darker hue than the characteristic light brown of the rest of the body. Anal cirri are present on some specimens and are long, cirriform. There are some differences in the number of elytra and their distributions. These and other features are listed in Table 3.

Remarks. The original description of this species by Kudenov (1977) is incorrect in two important respects. The complete specimens all have more than 15 pairs of elytra (see

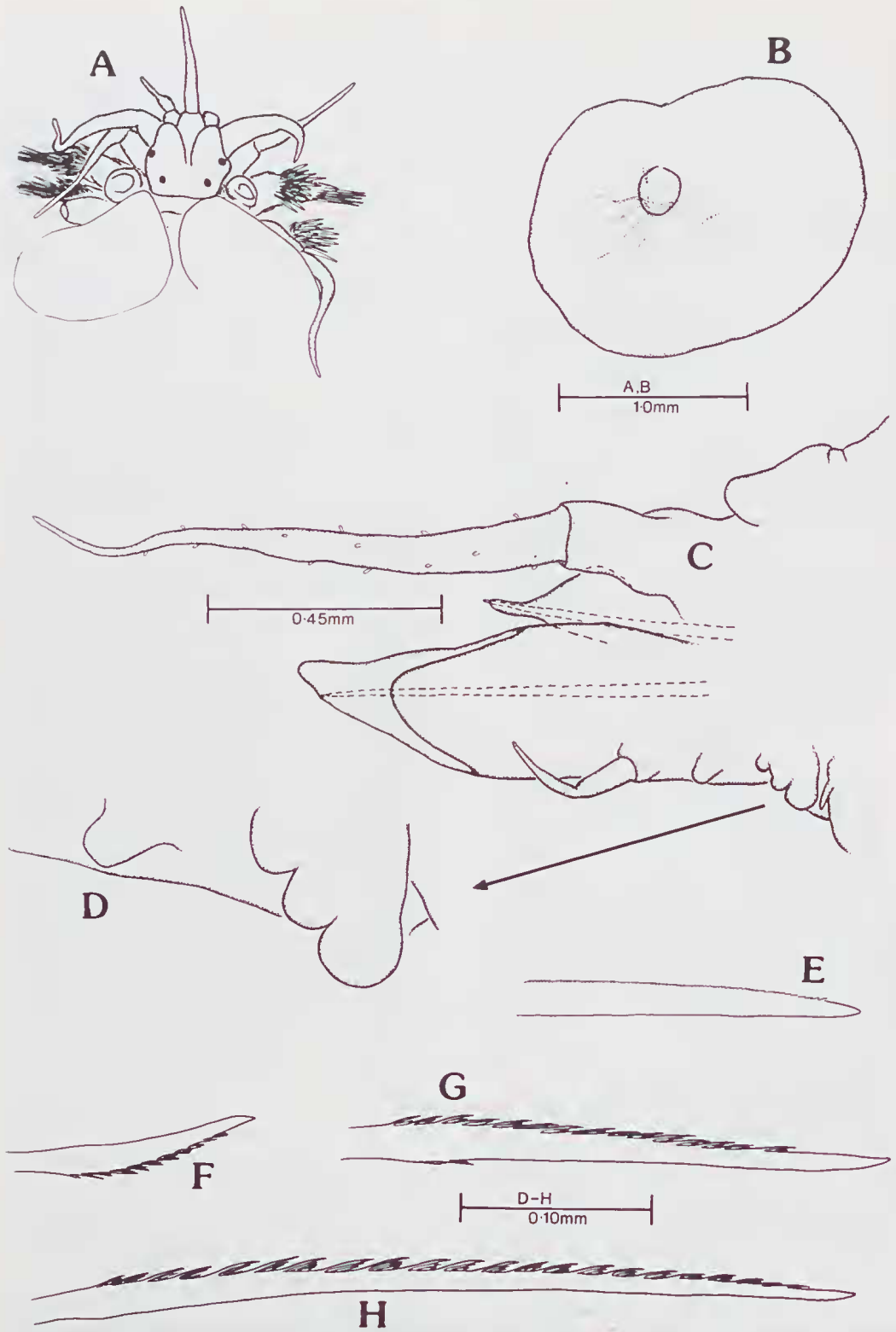

Fig. 4. *Lobopelma microscala* holotype: **A**, anterior end; **B**, elytron from middle of body; **C**, parapodium from left side of 18th segment; **D**, enlargement of ventral surface of parapodium showing distinctive tubercles; **E**, notoseta; **F**, inferior neuroseta; **G**, middle neuroseta; **H**, superior neuroseta.

Table 3. Variable features of paratypes of *Lobopelma microscala*

Paratype	Length (mm)	Width (mm)	No. segments	Pairs of elytra	Elytra attached on segments
MV G2545	7.80 (incomplete)	3.72	29-7 segments missing from middle of body	16	2,4,5,7,9,11,.....21,23,26,29,32,35
MV G2546	10.80	4.56	38	17	2,4,5,7,9,11,.....21,23,26,29,32,35, (37 left side, 38 on right side.
AM W7281	11.88	3.48	38	18	2,4,5,7,9,11,.....21,23,26,29,32,35,36,37
AM W7280 (anterior end)	4.80 (incomplete)	2.80	20	10	2,4,5,7,9,11,13,15,17,19.

Table 3 and holotype description). In addition, Kudenov confused the unusual tripalmate lobe, found on the ventral surfaces of the parapodia of all the type material, with the nephridial papilla. The nephridial papillae are well developed and lie in their usual position at the junction of the ventral surfaces of parapodium and body (Fig. 4 C).

The maximum number of elytra found on the material examined was 18 pairs. It is possible that specimens with more body segments and/or pairs of elytra will be found, but I suggest that as some of the material examined contains oocytes (MV G2546) then it is unlikely individuals of this species attain a much greater body length than the range reported here.

There are a number of polynoid genera which have more than 15 pairs of elytra, however there are only three genera that have 16 to 18 pairs of elytra, are short-bodied i.e. a maximum of approxiamately 38 segments, and possess notosetae. These genera are *Acanthicolepis* McIntosh, 1900, *Halosydna* Kinberg, 1855 and *Alentia*.

Despite the similarities, Lobopelma differs significantly from them in the expression of several characters (Table 4), currently accepted as important in the diagnosis of polynoid genera (Pettibone, 1969).

The function of the lobes on the ventral surface of the parapodia of *Lobopelma microscala* is unknown. The flattened, tripalmate shape of the larger lobes suggests a respiratory function. Branchiae are not common among species of the Polynoidae, and those described so far are found only on the dorsal surface of the parapodia (eg. Pettibone, 1985).

If the respiratory water currents observed in *Halosydna brevisetosa* (Lwebuga-Mukasa, 1970) are assumed to be representative of the pattern in most polynoid worms, then the position of the branchiae upon the dorsal surface of the parapodia is advantageous as it places the respiratory organs in the middle of the incoming water. No such advantage would be enjoyed by an individual in which branchiae were located on the ventral surface and it seems unlikely that the ventral lobes of *Lobopelma microscala* act as respiratory organs.

Halosydnopsis and related genera (Pettibone 1977) all have papillae or tubercles on the parapodia. However, the tubercles are always filiform and restricted to the distal ends of the neuropodial lobes.

Phyllohartmania has paired foliose appendages on each segment (Pettibone 1961). However, these lie on the ventrum, not on

Table 4. Comparison of important generic characters

Genus	Elytra	Elytra attached to segment no.	Notosetae	Other
Lobopelma	16-18 pairs	2,4,5,7,9,11.....21,23, 26,29,32,35 then variable 1 to 3 pairs on 36,37 or 38, often asymmetric	thicker than neurosetae, finely serrated	lateral antennae attached ventrally cephalic peaks absent, lobes on ventral surface of parapodia
Acanthicolepis	18 pairs	2,4,5,7,9,11,.....21,23, 26,29,32,34,35,38	thicker than neurosetae, whorls of serrations	lateral antennae attached ventrally
Alentia	18 pairs	2,4,5,7,9,11,.....21,23, 26,29,32,35,38,39.	capillary	lateral antennae attached terminally
Halosydna	18 pairs	2,4,5,7,9,11,.....21,23, 25,27,28,30,31,33.	slender, much thinner than neurosetae	lateral antennae attached terminally

the parapodia and the type-species of the genus P. taylori, has only 14 pairs of elytra.

Phyllosheila (Pettibone 1961) has papillae on the ventral surface of the parapodia but these are variable in number. In addition the ventral cirri are foliose and the type species *P. wigleyi* has only 15 pairs of elytra.

Distribution. Known only from Port Phillip Bay, Victoria, Australia.

Subfamily Lepidonotinae Willey, 1902
Genus *Halosydna* Kinberg, 1855
Halosydna hartmanae (Kudenov) comb. nov.

Malmgrenia hartmanae Kudenov, 1975: 77-79, Fig. 2 a-g.

Type material. HOLOTYPE - AHF 1118, Gulf of California, Mexico, 31°10'N, 113°50'W, in lateral setae of *Aphrodita mexicana*, found by K. Zimmerman.

Remarks. The elytra are attached on segments 2, 4, 5, 7, 9,.....21, 23, 25, 27 & 28. This does not agree with the distribution of elytron attachment on species of *Harmothoe*. The species could be referred to *Parahalosydna*, but the neurosetae are more like those of *Halosydna* sp. All the setae are typical of *Halosydna* species and the arrangement of elytra is also typical of *Halosydna* although the specimen lacks the last 3 pairs. In addition, insertion of the lateral ceratophores upon the prostomium agrees very well with the Lepidonotine type (Fig. 3 K). Given these similarities *and* the small size (6mm length) of this specimen, I conclude it is a juvenile *Halosydna* sp.

Halosydna nesiotes (Chamberlin) comb. nov.

Polynoe nesiotes Chamberlin, 1919: 72, P1.8 Fig. 8, P1.9 Figs 1-5.

Malmgrenia nesiotes Hartman, 1938: 122.

Type material. HOLOTYPE - USNM 19460, Lower California, Santa Margarita Island. coll 1891.

Remarks. The specimen is in poor condition, having at some time been dry, a fact mentioned in the original description. The way the lateral ceratophores are attached to the ends of the prostomium on either side of the median antennae indicates this specimen is a lepidonotine polynoid. Both Chamberlin and Hartman individually record 34 segments. However, my interpretation of the material suggests there are 36 segments, a fact not easily discerned because of the state of the specimen, and because the specimen is in two pieces. Some parts of the midsection are missing from each piece. The elytra are then found on segments 2, 4, 5, 7, 9,.....21, 23, 25, 27, 28, 30, 31 & 33. This pattern matches that found on species of *Halosydna*, several of which have been recorded from the Gulf of California. The setae of *H. nesiotes* are also typical of the genus and I have no hesitation in the conclusion this specimen is a member of the genus *Halosydna*.

Incertae sedis

1. *Malmgrenia whiteavesii* McIntosh, 1874. The type is missing and the original description is too vague to allow determination of the taxonomic status of this specimen.
2. *M. alba* (Malmgren) 1865. Originally described as *Laenilla alba* the species is questionably a species of *Harmothoe* (*Laenilla* is a synonym of *Harmothoe*). The type is in Stockholm (NRS).
3. *M. micropoides Augener, 1918.* I have not seen the type material of this species. However, Augeners excellent description of the type specimen indicates the species may well be a member of the genus *Harmothoe* as it possesses the following important diagnostic features.

   The specimen lacks cephalic peaks and the lateral ceratophores are attached ventrally on the prostomium. There are 15 pairs of elytra attached on segments 2, 4, 5, 7, 9,.....21, 23, 26, 29 and 32. There are 36 segments and the elytra cover the entire body. These characteristics are considered herein to be typical of *Harmothoe* species. The setae figured by Augener are not quite similar to those of *Harmothoe* species as there appear to be two distinct types of notosetae, a characteristic typical of species of *Gattyana*. However, the neurosetae are bidentate, and this is not consistant with species of *Gattyana*. Without examination of the type specimen, the species is tentatively referred to *Harmothoe*.
4. *M. purpura* Day, 1960. In the original description Day mentions the presence of rudimentary ventral lamellae. Several other characters, notably the setae and parapodia, suggest this specimen is close

to *Paralepidonotus*. However, examination of the type material is necessary to decide whether the species should be referred to *Paralepidonotus* or elsewhere. Some of the type material is in the USNM.

5. *M. ampulliferoides* Uschakov and Wu, 1959. Dr Marian Pettibone first drew my attention to the similarity between the description of this species and the species *Paralepidonotus ampulliferus* (Grube) 1878. Indeed the authors themselves refer to *P. ampulliferus* and put forward a number of features which they believe distinguish their specimen from *P. ampulliferus*. Unfortunately, none of the features they use are reliable, eg. position of spherical ampullae on elytra, length of fringe on elytra, whether neurosetae are uni or bidentate. I agree with Dr Pettibone that this species is probably a specimen of *P. ampulliferus*, however, no mention is made in the original description of the presence or otherwise, of ventral lamellae. Without examination of the type of *M. ampulliferoides*, the referral of this specimen to *P. ampulliferus* is questionable, although Uschakov (1982:150) indicates he now considers this species to be a synonym of *P. ampulliferus*.

6. *M. crassicirrus* Willey, 1902. I have not been able to locate the type material of this species. Bergstrom (1916) referred the species to a new genus, *Gorekia* and deposited his specimens in Stockholm (NRS). The original description and the later one by Bergstrom suggest this species is close to *Harmothoe*. The only criterion Bergstrom uses to distinguish the species as a new genus is the presence of some tri- and quadridentate neurosetae. Given that only two specimens of the species are known it is possible the extra dentition on the neurosetae tips are an individual aberration. Indeed, in his description Bergstrom does state that some of the neurosetae have bidentate tips, a condition widespread in the Polynoidae. Assessment of the taxonomic status of this species is dependent on examination of the type. It is not clear whether Bergstrom examined Willey's type.

7. *M. monoechinata* Rullier, 1965. I have examined the holotype of this species (AM W3792), and I am presently uncertain of its status.

The pattern of attachment of lateral ceratophores on the underside of the prostomium in this specimen (Fig. 3 C) is similar to that of *Harmothoe praeclara* (Fig. 2 C), indicating the species should be placed in the Harmothoinae. The specimen has 15 pairs of elytra arranged on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 26, 29, and 32. There are only two elytra remaining with the specimen and these both have a central recurved boss. The notosetae are of two distinct types. Some are short, stout and coarsely serrated and the others are longer, fine tipped, thinner than the neurosetae and are finely serrated. These features of elytron arrangement and notosetae types are characterisities of members of *Gattyana* McIntosh, 1900. Species of *Gattyana* also have neurosetae on which the distal ends are stoutly unidentate, a feature exhibited by the type of *M. monechinata*. However, Pettibone (1986) has recently revised several of the species formerly assigned to *Gattyana*. Her amended diagnosis based on the type species *G. cirrosa* (Pallas), 1766, suggests only species with distinct cephalic peaks should be assigned to *Gattyana*.

I have examined the holotype (AM W10570) of *Parahalosydna chrysostichtus* Hutchings and Rainer, 1979 and consider the specimen to be synonymous with *M. monoechinata*.

Comparision of the type material of both species reveals no differences between the specimens in respect of: elytron number and arrangement upon the body; prostomial features such as shape, eye position, insertion of lateral ceratophores; elytron shape and ornamentation; shape of noto and neuropodia; characteristics of setae; distribution and habitat.

The material examined of these two species cannot be referred to *Parahalosydna*. The way in which the lateral ceratophores are attached to the underside of the prostomium is distinctly harmothoine on the type material of *M. monoechinata* (Fig. 3 C) and *P. chrysostichtus*. In addition the arrangement of the 15 pairs of elytra on *P. sibogae* Horst, the

type species of *Parahalosydna* is 2,4,5,7,9, ...21, 23, 26,28, 30 in contrast to the pattern found on these two specimens.

8. *M. lunulata* (Delle Chiaje) 1841. This species was placed in *Malmgrenia* by Pettibone (1983:25). There are no types of *Polynoe lunulata* Delle Chiaje available. The status of the species is uncertain.

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